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BEYOND TRADITIONAL INTELLECTUAL PROPERTY: THE NECESSITY AND POSSIBILITIES OF STRENGTHENING THE PROTECTION OF TRADE SECRETS THROUGH ITS INTEGRATION INTO THE MODERN INTELLECTUAL PROPERTY SYSTEM[1]

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Abstract. The events of recent years, including the Russian Federation's aggression, China's intellectual property (IP) violations, and production localization fostered by the COVID-19 pandemic, have created a new global era in the field of IP enforcement and international trade relations. Russia has openly declared its intention to violate IP belonging to "unfriendly countries" (Western countries). This raises the issue of whether the existing patent system can handle these challenges. Namely, patenting involves the publication of an invention, which makes its misappropriation easy. The trends described above require specific adaptions for Western countries, as a result of which the author argues that the role of trade secret protection has become more prominent. However, assessing the suitability of trade secret protection in this changed environment is critical. Therefore, this article aims to first evaluate the current system of protecting trade secrets and then make suggestions to improve it.

Keywords: trade secrets, disclosure, reverse engineering, intellectual property.

Introduction

Digitalization and globalization have supported rapid economic development and the transformation of countries into knowledge-based economies. Despite minor inevitable tensions, the traditional intellectual property[3] (IP) system has functioned more or less satisfactorily so far. However, this trend was interrupted by certain events. Firstly, we had to face challenges caused by COVID-19. As a result of COVID-19, existing supply chains were interrupted, and governments had to start considering the localization of production.

The second challenge was even more significant. The Russian Federation's aggression against Ukraine began in February 2022 and has created a new global era in which international agreements are not upheld. This has also had an impact on the functioning of the IP system. In March 2022, the Russian Federation passed a decree allowing local companies and individuals to use the inventions, utility models and industrial designs of patent holders from "unfriendly countries" (Decree No. 430-p) without their consent or compensation (Decree No. 299). The effect of the Russian Federation's decree on intellectual property rights (IPRs) has manifested mainly in the fact that the protection of the rights of patent owners is no longer guaranteed. We should also not ignore the fact that China is not following a high level of IP protection. The reality is that relations between China and Western countries are rapidly deteriorating, and this could make the protection of IP originating from Western countries even more problematic. These are not the only examples, as Iran is involved in similar practices (see Lister, 2023).

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[3] Article 2 (viii) of the Convention Establishing the World Intellectual Property Organization defines intellectual property as "rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields." Intellectual property is traditionally divided into three main categories: copyright, rights related to copyright and industrial property.

The trends described above raise the question of how adequate and efficient patent protection is under these circumstances. Patent protection is based on the principle of disclosure to meet the enablement requirement, where the inventor publishes their invention and, in return, is guaranteed exclusive rights for a specific time. The reality is that the patent system can function in civilized societies, but we have a situation where Russia openly encourages IP theft and China, while not being as open about it, is inclined to permit the same. Therefore, it is appropriate to ask whether the existing patent system (based on the disclosure requirement) corresponds to the current needs of Western countries.

Problems with patent protection are reinforced with the localization of production. In other words, when production is within a country and is focused on the domestic market, patent rights are not necessarily required since patenting reveals proprietary knowledge. The author is not suggesting that the localization of production is a major irreversible trend; on the contrary, we still live in a globalized world, but the interruption of supply chains because of COVID-19 will certainly have an impact. The author is not also suggesting that the patent system will become completely obsolete – this is not going to happen. However, at the same time, changed international and economic relations will impact the functioning of the IP system.

The author argues that these circumstances make trade secret protection more relevant. Even now, trade secret protection is essential in knowledge-transfer systems (see Kelli et al., 2018; Kelli et al., 2014; Kelli et al., 2013).

If production is localized then there is no good reason to apply for a patent, since its publication allows actors from countries like Russia to copy an invention. Thus, the very least that Western companies can do is combine patents and trade secret protection.

This article explores whether the current trade secret protection system established at the European Union (EU) and international levels can overcome the challenges described, as the role of trade secret protection is increasing. Trade secret protection has certain advantages compared to patent systems: its scope is broader; it protects technical as well as business information; information to be protected as a trade secret does not have to be new in the sense of patent law, but it has to be secret, which is particularly convenient when there have been information leakages; the period of trade secret protection is not limited (information is protected as long as it is secret); and protection is not dependent on registration (the trade secret holder still has to take measures to keep the information secret).

The author proposes prohibiting the use of reverse-engineered products for commercial purposes and limiting the disclosure requirement in patent applications. These two preliminary proposals should be considered together.

The author is aware of the controversial nature of these proposals. These preliminary academic proposals are not made because of a lack of understanding of how trade secret protection and patent systems function. The author knows that reverse engineering and disclosure requirements constitute the core elements of patent and trade secrets systems. The author also understands that the proposed solutions are by no means a universal panacea.

However, it is also evident that the international world order is changing. This also affects the functioning of the IP system, which is an integral part of the innovation system. Therefore, there is a need to discuss how we should move forward.

The author relies on traditional legal methods such as the analytical method, analyzing European Union legal doctrine and legislation alongside examples of Estonian, Latvian and Lithuanian law. The author draws data from books, legislation, journals, reports, and other publications related to the topic of research. The results of this study form a preliminary starting point for discussion.

This study focuses on the key issue of whether the changed global circumstances have redefined the objectives of the IP system. Should the objective of the IP system be limited to rewarding innovation, or should it also aim to protect and enhance the technological knowledge base of Western countries? The author tends to support the latter position. This means that countries not supporting the international framework for IP protection should not take advantage of its benefits (e.g., they should not be able to copy inventions from disclosed patent documents). Limiting the scope of reverse engineering (not allowing the commercial use of acquired information) would

encourage European entrepreneurs to rely more on trade secret protection and to not reveal the essential parts of their technology.

To sum up, this article aims to look beyond pre-established dogmas and search for solutions which are not necessarily confined to the logic of existing systems. This does not mean that the proposed solutions should be implemented. One of the outcomes of this work could be to widen the scope of discussion and ensure that it is not trapped in the established framework. The author acknowledges that the answers to the problems described above could involve adopting completely new IP instruments to protect technology being copied by authoritarian regimes.

1. The Importance of Trade Secrets in the Intellectual Property System Due to the Challenges of Patent Protection

The IP system aims to promote and protect the sustainability of innovation by granting exclusive rights to the inventor. Trade secrets have mainly been compared to patents, and the objects of protection of these two systems have numerous similarities. Both patents and trade secrets protect ideas as knowledge; at the same time, it can be argued that every patent is preceded by a trade secret. A patent protects the inventor if its owner can enforce their rights in case of infringement (Drahos & Mayne, 2002, p. 15). This requires the enforceability of IP rights in national legal systems and reliable cooperative relations between national governments at the international level. The traditional IPRs system operates under a hierarchy of bilateral or multilateral agreements (Anderson & Razavi, 2010, p. 269). Unfortunately, due to a change in the global balance of security and a lack of respect for international institutions by authoritarian regimes, the current functioning of the patent system has come into question. It is impossible to have functioning legal relations with countries that engage in systematic human rights violations (including genocide), withdraw from international agreements, isolate themselves from the legal space and exclude any cooperation for the functioning of the patent system. Consequently, patent protection is no longer attractive, as enforcement is becoming impossible in certain large economic areas.

The fear of losing one's invention slows the innovation process and inhibits knowledge sharing, as there is no legal certainty when disclosing. The IP system is only helpful for promoting investment in innovation and economic growth if it is efficient, well thought out, and takes into account changes and events occurring in a specific time and space. The efficient protection and enforcement of IPRs is crucial for the EU's economic growth and the ability of various sectors to stimulate innovation and remain globally competitive.

According to a study conducted in 2019 by the European Union Intellectual Property Office and the European Patent Office, industries related to IP accounted for approximately 45% of the EU's gross domestic product, and were worth approximately €6.6 trillion per year (European Commission, 2021, p. 4). In addition, a large part of the EU's imports and exports is based on companies' activities which rely on IP rights (p. 4). Therefore, a comprehensive IP protection system must cover all of the different aspects of IP, such as appeals, enforcement rights, defense rights and transactional aspects.

In addition to security risks and intense conflicts between countries, the digital environment enables the wider and faster spread of products infringing IPRs. It is often difficult for consumers to distinguish genuine infringing products, which is compounded by the fact that infringers may use fake identities and are often located outside the EU, in jurisdictions with weak IPRs enforcement regimes (European Communication, 2017, p. 1).

The fields of information technology, robotics and manufacturing create more situations where trade secrets must at least partially protect information related to an invention. At the same time, political conflicts can facilitate the unauthorized use of valuable information for personal gain, especially to create a competitive advantage (Dreyfuss & Silberman, 2017, p. 266). More and more fields of activity where trade secrets protect companies' knowledge bases because other traditional forms of IP cannot provide effective legal protection have emerged, and they will continue to emerge in the future. Since inventions must be kept secret before a patent application (otherwise, novelty is lost), it could be said that patent protection begins with trade secret protection (Kelli et al., 2019, p. 18). However, it would be wrong to suggest that this is the only connection that trade secrets has with the protection of an invention.

Weaknesses in the patent system at the global level, the leaking of trade secrets, transnational economic espionage and the cold war of IP have raised a specific need to promote and strengthen the protection of trade secrets. This would ensure inventors' interest, opportunities for the consistent development of new solutions and products, and the protection of modern IP.

2. The Dynamics of Trade Secret Protection

2.1. The development of trade secret protection in the European Union

The right to trade secret protection is one of the general principles of EU law (Ginter et al., 2013, p. 659). The legal protection of trade secrets began in the middle of the 19th century in connection with the start of industrialization (Bone, 1998, p. 251), but the legal regulation of trade secrets in EU legislation took place significantly later, during the 21st century. The legal protection of trade secrets is based on the idea that know-how or information should be protected from unfair practices and theft. Theft of trade secrets consists of copying an invention containing its information or parts thereof, copying data, or otherwise maliciously exploiting data for general profit. Trade secrets are essential in protecting the exchange of knowledge between businesses. Trade secrets allow creators and innovators to derive profit from their creations or innovations and, therefore, are particularly important for business competitiveness, research and development, and innovation-related performance.

Article 1 (2) of the Paris Convention for the Protection of Industrial Property (hereinafter the Paris Convention) names the repression of unfair competition as an object of the protection of industrial property. The Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter the TRIPS Agreement) was the first piece of international legislation to explicitly regulate the legal protection of undisclosed information together with traditional IP (Ike, 2021, p. 285).

The TRIPS Agreement and the Paris Convention were adopted to protect IP, including industrial property. At the same time, the violation of a trade secret has traditionally been considered one of the clearest examples of unfair competition, which is why reliance on the principles of unfair competition is stipulated in the domestic legislation of many EU member states (Torresmans, 2015, p. 29).

Article 39 of the TRIPS Agreement stipulates the obligation to protect undisclosed information against unfair competition in accordance with Article 39(2). According to the latter, the following undisclosed information must be protected: that which is secret, and therefore has commercial value, and where the person with legal control over the information has taken the necessary measures to keep it a secret. Consequently, trade secrets that have commercial value must be protected from breaches of confidentiality and practices contrary to fair trade practices. However, this does not automatically exclude trade secrets from the domain of IP. For example, using a trademark without the owner's consent to market and sell products misleads consumers and leads to unfair competition, but IP provisions protect trademarks. The same ideology should be considered with trade secrets.

The TRIPS Agreement provides protection for undisclosed information, which is similar to the definition of a trade secret, and Article 1(2) seems to allow us to conclude that trade secrets belong to the field of IP. However, there is still a lack of clarity regarding the legal nature of trade secrets. In some academic circles, there has been a long-standing struggle to treat undisclosed information as equivalent to traditional forms of IP, which is why undisclosed information has been considered to be one of the cases where the norms of the field of unfair competition may apply (Correa, 2020, pp. 351–352). The author mildly disagrees with this assessment, and believes that undisclosed information, such as trade secrets in the context of the global digital economy, are an equivalent form of protection in the modern IP system, as are traditional forms of industrial property protection.

The TRIPS Agreement obliges the EU member states to establish minimum legal remedies in their national legislation to protect patents, copyrights, trademarks, and undisclosed information. At the same time, member states retain the freedom to decide on the content and measures of such legal remedies (Ike, 2021, p. 286). In the case of the discussed provisions of the TRIPS Agreement and the Paris Convention, the protection of trade secrets entailed a rather flexible but vague obligation which only concerned protection against unfair competition, leaving aside any civil protection in legal disputes related to trade secrets (Schröder, 2017, p. 58).

It has been found that trade secrets have increasingly significant importance in the development of the economy, especially for small- and medium-sized enterprises (Patel et al., 2016, p. 474). This particularly holds true in Estonia, because most Estonian entrepreneurs are involved in small-sized enterprises.[4]

In the case of *Varec SA v. Belgian State* (2008, para. 54), the European Court of Justice established that a competitor's illegal access to certain information can cause considerable damage to the company. In the case of *AKZO Chemie BV and AKZO Chemie UK Ltd v. Commission of the European Communities* (1986, para. 28), the European Court of Justice highlighted that third parties should under no circumstances have access to documents containing trade secrets, and the latter must be protected in any judicial or administrative proceedings. Otherwise, competitors could file complaints and thereby gain access to companies' trade secrets and/or business management (para. 28).

There was also an increasing fear among entrepreneurs that the differing legal protection of trade secrets between EU member states did not guarantee the effective implementation of legal remedies applicable to violations of trade secrets and endangered the disclosure of trade secrets (Patel et al., 2016, p. 474). As a result, in 2016, Directive 2016/943 of the European Parliament and of the Council was adopted on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure (hereinafter – the Trade Secrets Directive).

In most EU member states, the legal protection of trade secrets is dispersed between several legal branches, often in both criminal and civil law (Schröder, 2017, p. 58). In Portugal and Italy, the legal protection of trade secrets is governed by IP laws (Torresmans, 2019, p. 28). In Estonia, Poland, Austria and several other EU member states, trade secrets are protected with laws related to unfair competition, and some EU member states rely on general tort or contract law (p. 28). In the German Model Law on Intellectual Property, trade secrets are classified as IP, where they are referred to as a legal position protected by the provisions of IP (Värv, 2020, p. 419).

The Trade Secrets Directive was adopted into Estonian law on the 17 December 2018 when the Restriction of Unfair Competition and Protection of Business Secrets Act entered into force (for further discussion on the implementation of the Trade Secret Directive in the Baltic States, see Birstonas et al., 2020). Before the adoption of the Trade Secrets Directive, the protection of trade secrets in Estonian law clearly belonged to the field of competition law.[5] Afterwards, the legislator separated trade secrets from classical competition law and regulated the protection of trade secrets with a separate law act. Before the implementation of the Trade Secrets Directive in Lithuania, the protection of trade secrets was based on two different, although related, fields. This meant that the legal bases for the protection of trade secrets were regulated in the Civil Code and in the Law on Competition (Birštonas, 2019, p. 14). During the implementation of the Trade Secrets Directive in Lithuania, the new law on the Legal Protection of Trade Secrets was adopted, entering into force in 2018 (p. 17). The legal protection of trade secrets in Latvian law was previously scattered among different legal acts, such as the Commercial Act and the Freedom of Information Law, containing legal norms on the protection of trade secrets which fell either within public or private law depending on the legal relationship which was regulated (Birstonas et al., 2020, p. 352). After implementing the Trade Secrets Directive in Latvia, the new Trade Secret Protection Act was enacted in 2019.

Insofar as the Estonian Restriction of Unfair Competition and Protection of Business Secrets Act provides the scope of the law, it also regulates the prohibition of unfair competition. Therefore, the legal protection of trade secrets in Estonian law still belongs to the field of competition law. In Lithuania, as was the case before the implementation of the Trade Secrets Directive, trade secret protection remains based on the tort rule (Birštonas, 2019, p. 18). Thus, violating a trade secret is primarily considered inappropriate behavior in the economic environment and not a violation of IPRs. One possible explanation for conceptualizing the protection of trade secrets within the framework of unfair competition comes from the fact that, in practice, trade secrets have only consciously been used as an IP strategy in the last decade. That is why there was previously reason to consider

[4] See Statistics Estonia, http://andmebaas.stat.ee/Index.aspx?lang=et&DataSetCode=ER32 (retrieved 25 March 2023).
[5] Chapter 7 of the Estonian Competition Act (2001) stipulated the prohibition of confidential information, exploitation of an employee or representative of another company.

trade secret theft strictly as dishonest behavior regarding unfair competition. This position needs critical attention considering the effects of recent global events on the traditional IP system, as a result of which a clear stance that trade secrets should belong to the IP system in a knowledge-based economy should be taken.

2.2. The enforcement of trade secret protection rights

When placing trade secrets into the IP framework, it is essential, among other things, to identify the relationship between trade secrets and the Directive on the enforcement of intellectual property rights (hereinafter – the Enforcement Directive). Although it is clear that the Enforcement Directive extends to the enforcement of patent-related rights, there is some ambiguity in its application to protecting trade secrets. The Enforcement Directive is directly related to the TRIPS Agreement because it complements the latter with special measures regarding the enforcement of legal remedies. Just as in the case of patents, the provisions of the TRIPS Agreement are also relevant in protecting trade secrets insofar as they set the minimum legal requirements for the protection of undisclosed information.

From the drafting of the legislation mentioned above until today, there has been no consensus at the international level as to whether the legal protection of trade secrets is covered, among other things, by the legal protection of IP provisions. In addition, trade secrets are still not legally treated as an exclusive right, regardless of their numerous similarities with other types of IP and the goals of the IP system. Both industrial property and trade secrets are the result of intellectual work and consist of benefits with financial value, for the development of which investments have been made. Furthermore, similarities exist in the consequences of violating such benefits and in applying appropriate legal remedies. The main problem arises from the fact that neither the Enforcement Directive nor the Trade Secrets Directive exclude trade secrets from belonging to the field of IP.

The TRIPS Agreement is designed to protect IPRs. Still, it conceptualizes trade secrets from the perspective of unfair competition, which causes a conflict in the scope of application of the objectives of the Trade Secrets Directive and the Enforcement Directive. More specifically, the Enforcement Directive states that its scope must be defined as broadly as possible so that it covers all IPRs covered by the domestic laws of the EU member states. It does not exclude the notion that the EU member states may expand the provisions of the Enforcement Directive for domestic reasons by adding points on unfair competition (Directive 2004/48/EC, Recital 13). However, it is noteworthy that the legal protection of trade secrets under the Trade Secrets Directive should not affect the application of relevant law in any other field, including IP law and contract law. If the scope of the Enforcement Directive and the Trade Secrets Directive overlap, the Trade Secrets Directive should prevail (Directive EU 2016/943, Recital 39). Thus, upon initial interpretation, it could be concluded that the Enforcement Directive does not apply to the legal protection of trade secrets. The TRIPS Agreement allows for the conclusion that IP provisions indirectly cover the protection of trade secrets. According to the Trade Secrets Directive, it is not possible to apply the Enforcement Directive to the protection of trade secrets.

Furthermore, the TRIPS Agreement aims to ensure high-level IP protection. According to Article 1, the term "intellectual property" means all categories of IP which are discussed in parts 1–7 of section II, where part 7 constitutes the protection of undisclosed information (i.e., trade secrets). Compared to the TRIPS agreement, the Enforcement Directive does not clarify the scope of its objects. This is a significant shortcoming, which makes it possible to exclude trade secrets from the scope of the Enforcement Directive. The Trade Secrets Directive has stipulated that IP protection is one method of protecting innovation. Another way is to limit access to valuable knowledge in order for the entrepreneur to ensure their ownership of innovation results (Directive EU 2016/943, Recital 1).

In both cases there is either a kind of property right that is disclosed or access is restricted. In both cases, the starting point is the protection of innovation, which is the foundation of the IP system. It could be concluded that a trade secret belongs to the category of intellectual property but is not protected by an independent exclusive right.

For clarity, the wording of the Trade Secrets Directive should ensure a uniform understanding of the legal nature of trade secrets. It should be evident whether legal protection strictly belongs to the field of IP norms or whether it should be based on the norms of unfair competition.

Article 6(1) of the Trade Secrets Directive stipulates that "Member States shall provide for the measures, procedures and remedies necessary to ensure the availability of civil redress against the unlawful acquisition, use and disclosure of trade secrets." When the measures, procedures and remedies set out in Chapter 3 of the Trade Secrets Directive are compared with those stated in the Enforcement Directive, it appears they are largely similar, except for some differences. It has been observed that during the preparation of the Trade Secrets Directive, enforcement measures for legal protection were primarily based on the Enforcement Directive. This would mean a duplication of legal provisions, as some provisions were adopted unchanged, some were modified, and some were omitted from the Trade Secrets Directive (Riis & Schovsbo, 2019, p. 2).

Firstly, there are no obligations in the Trade Secrets Directive regarding measures to preserve evidence or to obtain orders regarding the origin and distribution networks of goods and services infringing IP (Aplin, 2021, p. 177). Secondly, the Trade Secrets Directive excludes a legal remedy, which involves the possibility of issuing temporary or final injunctions against intermediaries whose services are used to violate trade secrets (p. 177). Additionally, regarding the decision-making competence of legal authorities in terms of the granting of provisional or final remedies, unlike the Enforcement Directive, the Trade Secrets Directive clearly states the factors that should be taken into account when assessing the proportionality of the legal remedies (p. 177).

However, despite these differences, there are numerous similarities in terms of provisional and injunctive relief, final injunctions, remedial measures and damages awards, which seem to point to IP regulation (Aplin, 2021, p. 177). At the same time, according to the European Commission, it is impossible to apply the measures provided in the Enforcement Directive regarding the legal protection of trade secrets, as trade secrets are not considered an independent exclusive right or part of traditional IP (Abell & Wayne, 2015, p. 39). For this reason, it was decided to separate the enforcement measures related to the legal protection of trade secrets from the Enforcement Directive, which does not resolve the conflict with the TRIPS Agreement. In addition, dividing enforcement provisions between several directives may make litigation somewhat tricky, if not impossible.

More specifically, it may lead to the application of different enforcement measures in the case of a lawsuit, as the violation of a trade secret may include, among other things, other claims arising from the violation of IP. As a possible solution, the provisions of the Enforcement Directive could have been extended to a breach of trade secrets. Still, in this area, the European Commission noted that legal disputes related to trade secrets are primarily regulated through ordinary civil legal proceedings, and did not consider it necessary to further expand the provisions of the Enforcement Directive (European Commission, 2013, p. 268). Several arguments about the existing case law and legislation of the EU member states and the reliance on the principle of exclusivity were the main reasons that, according to the European Commission, made it impossible to apply the Enforcement Directive with regard to trade secrets.

It must be recognized that the Trade Secrets Directive does not clearly regulate its relationship with the Enforcement Directive. What is problematic is the fact that the justifications of the Trade Secrets Directive allow for the conclusion that, in principle, it is possible to apply the Enforcement Directive to the protection of trade secrets as well. Only when the areas of application of the two directives overlap is the Trade Secrets Directive to be considered *lex specialis*. A similar conclusion can be drawn from the preceding discussion. However, it has been observed that such an interpretation is difficult to reconcile with the purpose of the Trade Secrets Directive, which is primarily to regulate fair trade activities and to ensure the smooth functioning of the internal market (Knaak et al., 2014, p. 5). The position that the Enforcement Directive cannot be extended in terms of trade secret protection has been widely accepted. It would be necessary to stipulate a similar position in the Trade Secrets Directive to exclude contradictions between certain legal acts. Implementing this proposal would also ensure a degree of legal clarity regarding the legal nature of trade secrets, and would promote the consistent interpretation of legal regulations.

3. The Ideology of Trade Secrets

The legal clarity concerning trade secrets allows us to conceptualize its position in the modern IP system. The integration of trade secrets and patent protection could lead to considerable synergy.

Trade secrets have not been treated as traditional IP. Their legal protection has emerged only in the last 10 years, and the main discussion has surrounded the question of whether the bases for the legal protection of trade secrets derive from property rights or tort law in the framework of unfair competition (Menell et al., 2020, p. 43). At the same time, it is appropriate to assess whether the foundations of the ideology of trade secret protection can be derived similarly to the ideology of intellectual property, i.e., patent law.

The lack of exclusivity is seen as the main obstacle to conceptualizing trade secrets as a type of IP. The issue of trade secrets ownership is not within the scope of this paper. However, the author points out that defining trade secrets through ownership rights is problematic. This is not because of abstract objects of protection, but from the perspective of confidentiality. It has been questioned whether the object of IP protection must necessarily correspond to the concept of ownership in its content (Rognstad, 2018, p. 48). In contrast to traditional property rights, IP works require exclusive control for their effective use (Gosseries et al., 2008, p. 33), which can also be observed in the context of trade secrets.

According to the wording of Article 39 of the TRIPS Agreement, it is possible to conclude that the protection of trade secrets is not simply a matter of avoiding the disclosure of secret information, but that a specific person must have legal control over such information. The element of legal control allows for the inference that this classified information must be in a person's possession, which does not directly preclude the existence of ownership. Although the right to ownership of trade secrets is not guaranteed at the level of legislation, it is realistically possible to conceptualize trade secrets as a question of ownership to some extent. Nevertheless, it has never been argued that to offer protection against unfair competition it is necessary to guarantee a particular person the exclusive right of ownership of a trade secret (Aplin, 2021, p. 179). Consequently, the absence of an exclusive right cannot be an obstacle that excludes the inclusion of trade secrets in the IP system.

Exclusivity is a generally accepted concept within the IP system, and IP rights are referred to as exclusive rights (*ius excluendi*). Exclusivity does not need to be absolute to reward and stimulate innovation; instead, it should provide advantages for developing a new idea (Lemley, 2008, p. 330). This can be expressed in the limitation of certain competitive activities or mechanisms that allow legal control over the information related to the invention after its disclosure to be ensured. To understand this, it is necessary to look at the products of creative processes that need isolation or protection from excessive interference in the main stages of their development. Their forced disclosure can be so disruptive that it prevents the full effective use of these ideas (Gosseries et al., 2008, p. 33).

To define the concept of trade secret protection in the modern IP system, the author suggests the following statements as a starting point of discussion:

- A person with legal control over a trade secret has, in a sense, ownership of their economically valuable trade secret information.
- The legal protection of trade secrets in the field of IP allows, in addition to patents, innovation to be stimulated. Otherwise, inventors would give up investments in innovations or would make unnecessary efforts to hide their innovations.
- The legal protection of trade secrets promotes sharing knowledge with third parties, enabling the application of legal remedies provided by law in case of misconduct.
- Trade secrets promote patent disclosure insofar as a trade secret can protect information related to an invention, which helps protect the invention from abuses or economic espionage.

Trade secret protection exists for the same reason as patent rights: to encourage investment in research and development that results in information of commercial value (Lemley, 2008, p. 326). To the extent that a patent grants an exclusive right to an invention, the information related to the invention is not protected by an exclusive right as a trade secret. It provides protection as an intangible object in someone's possession that can be acquired through unfair competitive practices.

It is possible to justify the conceptualization of trade secrets as a type of IP. Trade secret protection is made of a set of trade secret rights which provide protection against possible unlawful disclosure and use. Thus, the only difference between traditional patent law and modern trade secret protection is the content and scope of their

rights (Risch, 2007, p. 19). However, it is difficult to imagine that it is possible to exclude the use of trade secrets by third parties due to confidentiality. Namely, trade secret protection is not based on its informational property. Still, the property protection of trade secrets is related to its classified nature (p. 22).

The doctrines of patents and trade secrets are constantly interacting because it is possible to protect an invention with different forms of protection (patents, trade secrets or even design rights if it is possible to represent the invention in a specific form). There are empirical studies and research articles on combining the two forms of protection (see, e.g., Kelli et al., 2010). The legal literature has so far mainly focused on comparing the contrasts between the abovementioned two forms of protection. Still, for example, considering the possible impact of the Russian Federation's aggression on the legal protection of IP, integrating the forms of patent and trade secrets should immediately be considered to prevent research and development from stalling and to ensure that their benefits are promoted to society.

From an innovation policy perspective, understanding the relationship between trade secrets and patents is crucial to predicting the impact of changes in the rights of different fields and countries on IP protection strategy. Suppose these two forms of protection are treated as alternatives. In that case, changes in different legal acts may favor one form of protection due to the weakening of the other. It can be assumed that strengthening trade secrets laws will make trade secret protection more favorable and the application of patents more complex – for example, in the case of biotechnology or information technology inventions (Linton, 2016, p. 12). Conversely, when patents and trade secret protection complement each other, they can be expected to respond similarly to legislative and policy changes (p. 12) and not create exclusionary competition.

4. Preliminary Recommendations to Strengthen the Protection of Trade Secrets

4.1. Limitation of the right to use the information acquired through reverse engineering for commercial purposes

Reverse engineering involves taking apart a legally owned product to understand how it is made or how it works (Menell et al., 2020, p. 61). The main driving force behind reverse engineering originates from the need to obtain information that is not publicly available.

According to the TRIPS Agreement, which constitutes one of the pillars of the international IP framework, the IP system must strike a fair balance between different interests. This principle is manifested in Article 7 of the TRIPS Agreement as follows: "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations." This principle encourages innovation and the exchange of information, and could be interpreted in support of reverse engineering.

The right to reverse engineering does not explicitly exist in patent law (Evans, 2013, p. 89). Since patenting requires disclosing information related to an invention and its technical specifications (the enablement requirement), there is no need to reverse engineer a patented invention to understand how it works (p. 90). The patent publication reveals sufficient information about the object of the patent claims, such that a person skilled in the art can use a specific invention. Patent law does not prohibit such activity if someone wants to reverse engineer a patented invention (Ohly, 2009, p. 543). The right to reverse engineer can also be considered a part of the experimental use exception. For instance, according to the Estonian Patent Act, the use of a patented invention in testing related to the invention itself does not constitute an infringement of the patent rights (§ 16(3)). On the contrary, Lithuanian and Latvian Patent law does not explicitly regulate reverse engineering with legal provisions.

Trade secrets law *expressis verbis* regulates reverse engineering. According to Article 3(1)(b) of the Trade Secrets Directive, "The acquisition of a trade secret shall be considered lawful when the trade secret is obtained by observation, study, disassembly or testing of a product or object that has been made available to the public or that is lawfully in the possession of the acquirer of the information who is free from any legally valid duty to limit the acquisition of the trade secret." Recital 16 of the Trade Secrets Directive further explains that "Reverse engineering of a lawfully acquired product should be considered as a lawful means of acquiring information, except when otherwise contractually agreed."

The Trade Secrets Directive, however, does not stipulate what can be done with a trade secret obtained through reverse engineering (Arcidiacono, 2016, p. 1080). According to the Trade Secrets Directive, reverse engineering represents the legal acquisition of a trade secret. Therefore, it can be assumed that a person who acquires a trade secret during reverse engineering can legally use it for their own benefit, including by reproducing an invention or a part of it that is protected by a specific trade secret. This, in turn, causes prejudice to the inventor's interests, especially the legitimate expectation of receiving legal protection for the disclosure of their creation (public sale of the product could also mean the disclosure of an invention protected by a trade secret). Consequently, if an invention or part of it is discovered through reverse engineering, it is possible to reproduce the product and thereby earn a commercial benefit. In a way, this aligns with Recital 16 of the Trade Secrets Directive, which emphasizes that "In the interest of innovation and to foster competition, the provisions of this Directive should not create any exclusive right to know-how or information protected as trade secrets."

Reverse engineering means acquiring trade secrets and integrating them into one's own invention without additional developmental costs. Reverse engineering allows one to use another inventor's product while trying to create an image of it as if it were an independent discovery (Ike, 2021, p. 292). According to this, the reverse engineering of a product alternatively resembles the reproduction of a product that is not in line with fair competition conditions.

One of the justifications for the permissibility of reverse engineering is its beneficial effect on the development of competition. Still, it is debatable whether disassembling a product to reproduce it later and use it for commercial purposes ensures fair competition.

Restrictions on reverse engineering in the case of trade secrets have been linked to the risk that the balance of patent protection would be weakened. If trade secrets were protected from reverse engineering, the initiative and number of patent applications would decrease (LaRoque, 2017, p. 451). Still, in a world where some countries do not recognize foreign patents and allow the use of inventions without the owners' consent, it is not conceivable to disclose one's invention despite the patent protection.

One option to strengthen the inventor's position is to limit reverse engineering. This would be an additional motivator to choose trade secret protection instead of patent protection. The limitation of reverse engineering is supposed to function within the Western IP system. However, the impact of this on enemy states would be that inventors would not patent some inventions (relying on trade secret protection) and, therefore, would not disclose the nature of the invention. Nothing stops authoritarian regimes from illegal reverse engineering. However, this would require more effort (e.g., they would need to get hold of a product, run tests, etc.) than accessing and copying patent documents. Communication technology makes the latter especially easy.

The author is aware that the concept of reverse engineering cannot be changed within the current regulatory framework. However, now might be the right time to start discussing the limitation of its scope. Namely, the author raises the issue of whether using reverse-engineered products for commercial purposes should be forbidden. This would fundamentally impact the trade secrets framework, raising many relevant objections. It could be argued that restricting the commercial use of information acquired through reverse engineering would create legal uncertainty. Competitors could easily be accused of trade secrets infringement (i.e., in the commercial use of reverse-engineered information), even if acquired by independent discovery.

Regarding the legal uncertainty argument, the solution to prohibit the commercial use of information acquired through reverse engineering (essentially copying) is not unprecedented. For instance, copyright law also allows for the independent creation of the work (similarly to trade secret protection), but considers (even subconsciously) copying to represent copyright infringement. Article 1(2)(a) of the Community Design regulation (CDR) (No. 6/2002) establishes the protection of unregistered Community design. An unregistered Community design is protected for three years (Article 11) and confers on its holder the right to prevent the copying of the design (Article 19). The renewed trade secrets framework would follow the same logic.

All possible uncertainties can be solved through case law and the amendment of regulations. For instance, if the defendant argues that they independently discovered a trade secret, then it is up to the claimant to prove that the defendant reverse engineered the product.

Like an unregistered design, a trade secret could be protected against copying (i.e., the commercial use of a product based on reverse engineering) for a limited duration (e.g., 3 years from the first use of a product containing a trade secret). Reverse engineering should remain legally permitted if it is related to research and fulfils the latter's goals. The right of independent creation would not be affected by the discussed proposal.

It is possible to treat reverse engineering as a violation of a trade secret if the reverse engineering of an invention is similar to its theft or, figuratively speaking, breaking into the territory of the inventor. Such an approach does not inhibit the spread of innovation and does not prohibit the reverse engineering of an invention for scientific purposes. In addition, the question may arise as to whether the restriction of the right to reverse engineering requires the application of the exclusivity principle to a certain extent in the case of trade secrets. In response, the author considers that this is not a matter of completely excluding the right to reverse engineering, but instead limiting it to a certain extent based on the promotion of fair competition conditions and the further development of innovation. The legal holder of a trade secret is not guaranteed a monopoly of knowledge, but their interests in disclosing the invention are protected.

4.2. Limiting the disclosure of the content of patent applications

The documents submitted with the patent application are of critical importance in the context of their disclosure. These documents contain detailed information about the invention's structure, which may weaken the legal protection related to it. In the description of the invention submitted in the patent application, the nature of the invention must be disclosed so precisely and clearly that a person skilled in the art can carry out the creation of the invention. This requirement has been considered by the European Court to be a common feature of modern patent systems (*Kingdom of the Netherlands v. European Parliament and Council of the European Union*, 2001, para. 24). The clear and precise disclosure of the nature of the invention does not require the patent applicant to disclose all relevant details of the invention. As a rule, it is necessary to provide sufficient technical information in the patent application so that a person skilled in the art can reproduce the invention without significant obstacles or numerous experiments (Asay, 2016, p. 268).

On the one hand, it is an inherent feature of the patent system to make information on patented inventions publicly available. On the other hand, the changed political situation wherein some countries openly challenge the existing economic institutions (including the IP system) forces democratic societies to look for new (even unconventional) solutions. One very preliminary route would be to explore whether it would be possible to limit the extent of disclosure of patent applications.

Firstly, it should be borne in mind that patent applications are often filed because it is impossible to keep an invention secret (it is possible to obtain information by reverse engineering). Secondly, members of society (including competitors) have to know the scope of patent protection. If the information on patented inventions is not public, then there is no legal certainty as to the extent of patent protection. The patent gives its owner the exclusive right to prohibit other persons from exploiting the patented invention, so these other persons must know exactly what inventions are patented. So far, various modifications to the patent system have attempted to ensure more extensive and detailed patent disclosure (Burk, 2016, p. 1607).

However, we should bear in mind that the non-disclosure of patent information is already known to patent law. For instance, the Estonian Patents Act regulates patent applications containing a classified invention. Most inventions are disclosed in official patent registers. However, some inventions can be classified as inventions that are of importance for national defense (Ostrat, 2012, p. 565). According to Article 35(8) of the Estonian Patent Act, upon registration of an invention, the Patent Office publishes a patent grant notice and the patent specifications in its official gazette, unless the patent application is classified. In Lithuanian law, Article 27(3) of the Patent Law Act states that access to an invention which has been made secret shall be provided in the manner prescribed by legal acts. Section 11(2) of the Latvian Patent Law Act stipulates that if an invention is recognized as secret, then making the patent application and the granted patent public shall not be applicable to the procedure for granting the patent. Overall, classified inventions are inventions that have a dual-use option: they can be used both in and outside of national defense. These inventions contain solutions that, in the opinion of the competent

bodies, must be kept secret, either completely or to a limited extent, and whose entry into civilian circulation must be excluded (Ostrat, 2012, p. 565).

In Estonian law, only patent applications submitted for national defense inventions classified by the Ministry of Defence or the corresponding authority of a foreign country are subject to classification. The same applies in Latvian law, which states that if an invention affects the interests of the State defense bodies, the Ministry of Defence may allocate secret invention status thereto. Article 7 of the Estonian State Secrets and Classified of Foreign Information Act treats state defense inventions as state secrets, the scope of which is established separately by the minister responsible for the field for each invention. According to Article 1 of the NATO Agreement for the Mutual Safeguarding of Secrecy of Inventions Relating to Defence and for which Applications for Patents Have Been Made, parties to this agreement shall safeguard and cause to be safeguarded the secrecy of inventions for which applications for patents have been received under agreed procedures whenever secrecy has been imposed on such inventions in the interests of national defense by the Government.

Patent application secrecy arose during WWI and WWII, when it became apparent that the inventions most beneficial to the government in wartime would also convey useful information about the nation's military capabilities to the enemy when disclosed (Saltz, 2022, p. 215). A similar analogy can be applied to modern invention protection. Due to the public availability of patent applications, authoritarian regimes can obtain information about the technical capabilities of a particular country and use this information to strengthen their competitive advantage, completely ignoring the compensation regime of the existing patent system. Similarly to ordinary patents, the registration of a classified patent in the patent register takes place in the general procedure. Still, differences lie in the availability of the content of this classified patent application to the public (Ostrat, 2012, p. 570). Thus, it is possible to raise parallels with the concept of secrecy underlying the protection of trade secrets and to analyze the possible impact of the secrecy of patent applications on innovation and knowledge transfer.

Suppose the existing patent system continues to focus on the principle that the disclosure of technical information is an unavoidable circumstance for the system's functioning. In that case, inventors may start looking for other ways to partially hide information related to their inventions. Inventors may deliberately omit critical technical information from a patent application or may obscure such information with complex legal terms unfamiliar to those skilled in the art related to the invention (Zaby et al., 2022; Rassenfosse & Higham, 2021, p. 15). Complexly worded or unclear patent applications no longer fulfil the function of patent disclosure, as the information related to the invention is not presented clearly and needs additional codification (Rassenfosse & Higham, 2021, p. 15). Consequently, if it is necessary to protect some critical parts of the invention from disclosure, it would be appropriate to integrate the ideology of trade secret protection into the patent system. This would allow a part of the patent application to remain undisclosed – for example, documents related to technical detail, for which additional requests can be submitted to the patent office.

If we consider the history of the patent system, it is argued that in countries with patent laws, the majority of innovations have taken place outside the patent system (Moser, 2013, p. 40). In addition, it is now quite challenging to navigate publicly available information because new information is produced in an insane amount, and receiving it and assessing its adequacy is rather time-consuming. Consequently, if a significant proportion of innovation takes place outside the patent system, strict patent disclosure requirements do not justify patent disclosure from the point of view of fostering innovation (p. 40). It can be agreed that, in a certain sense, patents represent a primary source for promoting innovation. However, limiting the disclosure of patent applications should not directly affect innovation, resulting in a significant reduction in the creation of new inventions.

Additionally, it has been argued that some companies do not depend on technical information in patent applications to advance their research and development efforts (Eckert & Langinier, 2014, p. 5). There are suggestions that engineers in many fields rarely read patents to learn about technology (Lemley & Feldman, 2016, p. 4). The reason for this can be attributed to the fact that reading the information published in patent applications may not be useful on its own, but rather requires the existence of certain know-how that can be shared through various forms of cooperation. Therefore, it can be argued that the non-disclosure of technical information in public databases does not prevent the continuation of future innovation. In the modern world of science, cooperation

between research institutions, scientists, engineers or other specialists plays a central role (e.g., through the publication of research results).

Disclosure of the technical details of the invention in patent documents does not always facilitate the spread of knowledge. The publicity of the patent system is not attractive for inventors in the context of the current market economy, nor does it encourage the publication of information related to the invention. The patent owner cannot enforce their rights in the context of certain global trade relations. More specifically, to incentivize inventors to disclose their inventions in the future, the possibility of partial non-disclosure of technical information related to the invention in the official databases of patent applications should be ensured, applying the concept of trade secret protection to this part. Integrating the ideology of patent and trade secret legal protection allows the disclosure of general information related to the invention. Still, trade secret protection should cover specific and technical information (Price, 2017, p. 1618).

A possible solution is to integrate both patent and trade secret protection elements into the information related to the invention, thereby limiting the patent system's publicity to a certain extent. Restricting the publication of the information of a patent application would be based on its connection with trade secrets. Therefore, a situation where the inventor decides on their own what information related to the invention they want to publish, which would thereby exclude any possibility of disseminating new knowledge in society, would not emerge. In practice, the described solution would manifest itself so that all of the information required by law is indicated in the patent application so that the patent office can assess the invention's compliance with the criteria. Still, when the patent application is made public, this information, which falls under the scope of trade secret protection, is not disclosed. This is consistent with both forms of protection, where patents encourage the disclosure of information while trade secrets protect the secrecy of information. Again, this is a preliminary quest for solutions to challenges created by international developments and should not be interpreted as a final proposal.

Conclusions

The author assessed the adjustment of the trade secrets and patent protection systems to meet new requirements considering the changed circumstances. The suggested solutions are preliminary; they serve as a starting point for a discussion on the possible reform of the IP system to correspond to new international settings.

Regarding the right to reverse engineering, patent law does not prohibit such activity if someone wants to reverse engineer a patented invention. Patent laws usually provide a specific exception for testing related to the invention itself. Usually, this is unnecessary since an invention is disclosed in the patent application anyway (the enablement requirement).

When it comes to trade secret protection, reverse engineering is explicitly regulated. A person who discovers a trade secret during reverse engineering can legally use it for their benefit. It can be argued that this harms the inventor's interest. One way to strengthen trade secret protection is to limit the scope of use of the inventions obtained through reverse engineering. It is debatable whether disassembling a product to reproduce it later and use it for commercial purposes ensures fair competition. It is possible to treat reverse engineering as a violation of a trade secret. Such an approach does not inhibit the spread of innovation nor prohibit the reverse engineering of an invention for scientific or educational purposes. The burden of proof as to whether a competitor's product is based on information acquired through reverse engineering lies with the trade secret holder.

The author is aware that there are several counterarguments against this approach. Firstly, it could be argued that if the reverse engineering right were to be limited to the experimental use exception, then it would be hard to distinguish trade secret protection from patent protection. On the one hand, the patent system generates income for society through patent fees. This is part of the social contract, which obliges a patent applicant to disclose the invention and pay patent fees and the society to offer the protection of patent rights. Trade secret protection is offered for free (this is not entirely true, but there are no state fees at least). On the other hand, the social contract cannot be wholly upheld since, in countries like the Russian Federation and China, one cannot effectively protect their rights and technology could be misappropriated through patent disclosures. Therefore, offering an equivalent alternative to patent protection requiring disclosure could be fair. The restriction of reverse engineering should not be absolute. Firstly, a specific time limit should exist (e.g., 3 years after making the product publicly available).

Secondly, reverse engineering should be limited only to commercial purposes (creating a competing product) but should be allowed for other purposes, such as scientific research.

Another preliminary proposal to ensure a functional IP system at the international level is to consider limiting the disclosure of the content of patent applications. It should be clear that an inherent feature of the patent system is to make the information on patented inventions publicly available. However, the changed political situation where some countries openly challenge existing economic relations forces democratic societies to search for new, even unconventional, solutions.

Prior patent system modifications have attempted to ensure more extensive and detailed patent disclosure. Still, we should bear in mind that the non-disclosure of patent information is already known to patent law. Although most inventions are disclosed in official patent registers, some inventions can be classified as inventions of importance to national defense. Compared to regular patents, a classified patent is registered in the general procedure, but differences lie in the availability of the content of this classified patent application to the public. This allows parallels with the concept of secrecy underlying the protection of trade secrets to be drawn. The disclosure of technical details of the invention in patent documents does not always facilitate the spread of knowledge. Consequently, a possible solution is to integrate both patent and trade secret protection elements into the information related to the invention, thereby limiting the patent system's publicity to a certain extent and restricting the publication of the information of a patent application.

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